the programming unit, and/or

the software function blocks (SF01, ..., SF04) can be sent to the programming unit over the Internet and the Internet communication interface;

having at least one operating and monitoring device having operating and monitoring software blocks of an operating and monitoring software program for creating and displaying a process image that includes multiple image objects and is provided for process management, the image objects being related to software function blocks of a control program which is processed by a programmable controller during control operation, the operating and monitoring software blocks being designed to be loadable and to be capable of being tied into the operating and monitoring program while it is running, characterized in that

A3 Cont.

the operating and monitoring device creates object-oriented operating and monitoring software blocks,

the operating and monitoring software blocks can be transmitted by the operating and monitoring device over the Internet and the Internet communication interface of the operating and monitoring device, and/or

operating and monitoring software blocks and/or process quantities can be sent to the operating and monitoring device over the Internet and the Internet communication interface, and

the operating and monitoring device has an operating and monitoring software block execution system (operating and monitoring object engine system) for processing the operating and monitoring software blocks; and

having at least one workstation and/or a server which have means for creating and processing object-oriented software function blocks (SF01, ..., SF04).

REMARKS

This Preliminary Amendment is submitted to improve the form of the application as originally-filed.

It is respectfully requested that this Preliminary Amendment be entered in the above-referenced application.

If any further fees are required in connection with the filing of this Preliminary Amendment, please charge same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: June 8, 2001

By: _____
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please AMEND the paragraph beginning at page 4, line 8, as follows:

The object-oriented software function blocks are programmed by the respective programming units 7 (Figure 1) at [manutacturing] manufacturing sites 1, 2 or by a programming unit 14 which is likewise connected to the Internet. In addition to operating and monitoring devices 8 and workstations 9, these programming units 8, 14 are parts of the management engineering system. The programming units send these software blocks to the corresponding programmable controllers over the Internet and the respective Internet communications interface. In the event that blocks must be altered, for example, programmable controller 6 or a server 13 first transmits the corresponding software function block over the Internet to one of programming units 7. Finally, programming unit 7 supplements or modifies this block and can transmit it again to one of the programmable controllers. The programming unit is also provided with a software function block execution system (PLC object engine system; Bos, ExE, Wd, IO) which is provided for simulation of the control program.

Please AMEND the paragraph beginning at page 4, line 20, as follows:

The processes to be controlled at manufacturing sites 1, 2 are operated and controlled by the operating and monitoring devices 8 that can be connected to the [Internee] Internet and operated on the Internet. An operating and monitoring device 8, e.g., operating and monitoring device 8 at manufacturing site 1, creates an operating and monitoring program that encompasses an operating and monitoring software program for creating and displaying a process image containing multiple image objects, where the image objects are in relation to (in interaction with) software function blocks of the control program. The operating and monitoring software blocks are designed to be object-oriented and directly transmittable over the Internet. It is possible to create the process image on programming unit 7 and to send it over the Internet to operating and monitoring software unit 8 for process management.

IN THE CLAIMS:

Please CANCEL claims 1-11.

Please ADD the following new claims:

12. (NEW) Programmable controller to which software function blocks of a control program can be sent, the program being processed by the programmable controller cyclically and/or with interrupt control during control operation, the software function blocks being designed to be loadable and capable of being tied into the control program while it is running, characterized in that

the software function blocks (SF01, ..., SF04) are designed to be object-oriented and loadable into the programmable controller over the Internet and an Internet communication interface of the programmable controller, and

the programmable controller has a software function block execution system (PLC object engine system; Bos, ExE, Wd, IO) for tie-in of the software function block objects (SF01, ..., SF04) and for processing the control program.

13. (NEW) Programmable controller according to claim 12, characterized in that

the software function block execution system includes an exe engine object (ExE), a watchdog (Wd), a bootstrap (Bos) and an input/output module object (IO), in which a process image of inputs and outputs can be deposited, and to which signal states can be sent from process inputs and through which signal states can be sent to process outputs,

the bootstrap (Bos) generates the software function block objects (SF01, ..., SF04) and the input/output module object (IO) before the start of control operation and sends the following to the exe engine object (ExE):

a list of the software function block objects (SF01, ..., SF04) to be processed for the case of cyclic processing of the control program,

a list of the software function block objects (SF01, ..., SF04) to be processed for each process input for the case of interrupt-controlled processing of the control program,

at the start of control operation, the bootstrap (Bos) starts the exe engine object (ExE), which first starts the watchdog (Wd) which resets the exe engine object (ExE) when the cycle time is exceeded, and then cyclically

updates the inputs of the process image,

processes one processing step of the software function block objects (SF01, ..., SF04)

for the case of cyclic processing of the control program,

ascertains changes in signal states at the inputs for the case of interrupt-controlled processing of the control program and processes the software function block objects (SF01, ..., SF04) assigned to these inputs,

updates the outputs of the process image.

14. (NEW) Programmable controller according to claim 13, characterized in that the exe engine object (ExE) and the watchdog (Wd) are designed as threads.

15. (NEW) Programmable controller according to claim 12, characterized in that the communication interface permits TCP/IP protocol communication.

16. (NEW) Programmable controller according to claim 12, characterized in that the software function blocks (SF01, ..., SF04) are Java-byte-coded and can be created in Java C programming language or in a programming language that complies with the IEC 1131 standard.

17. (NEW) Programming unit for creating software function blocks of a control program that can be sent to a programmable controller which processes the control program cyclically and/or with interrupt control during control operation, the software function block objects being designed to be loadable and to be capable of being tied into the control program while it is running, characterized in that

the programming unit creates object-oriented software function blocks (SF01, ..., SF04),

the programming unit sends the software function blocks (SF01, ..., SF04) to the programmable controller over the Internet and an Internet communication interface of the programming unit, and/or

the software function blocks (SF01, ..., SF04) can be sent to the programming unit over the Internet and the Internet communication interface.

18. (NEW) Programming unit according to claim 17, characterized in that the programming unit has a software function block execution system (PLC object engine system; Bos, Exe, Wd, IO) for simulation of the control program.

19. (NEW) Programming unit according to claim 17, characterized in that the

communication interface permits TCP/IP protocol communication.

20 (NEW) Programming unit according to claim 17, characterized in that the software function block objects (SF01, ..., SF04) can be created in Java C, the programming language which can run on the programming unit, or in a programming language that complies with the IEC 1131 standard, and they can be translated to Java byte code by the programming unit.

21. (NEW) Operating and monitoring device having operating and monitoring software blocks of an operating and monitoring software program for creating and displaying a process image that includes multiple image objects and is provided for process management, the image objects being related to software function blocks of a control program which is processed by a programmable controller during control operation, the operating and monitoring software blocks being designed to be loadable and to be capable of being tied into the operating and monitoring program while it is running, characterized in that

the operating and monitoring device creates object-oriented operating and monitoring software blocks,

the operating and monitoring software blocks can be transmitted by the operating and monitoring device over the Internet and the Internet communication interface of the operating and monitoring device, and/or

operating and monitoring software blocks and/or process quantities can be sent to the operating and monitoring device over the Internet and the Internet communication interface, and

the operating and monitoring device has an operating and monitoring software block execution system (operating and monitoring object engine system) for processing the operating and monitoring software blocks.

22. (NEW) Operating and monitoring device according to claim 21, characterized in that the communication interface permits TCP/IP protocol communication.

23. (NEW) Operating and monitoring device according to claim 21, characterized in that the operating and monitoring software blocks can be created in Java C, the programming language which can run on the operating and monitoring device, or in a programming language that complies with the IEC 1131 standard and they can be translated to Java byte code by the operating and monitoring device.

24. (NEW) Intelligent field unit to which at least one software function block of a control program can be sent, the program being processed by the field unit cyclically and/or with interrupt control during control operation, the software function block being designed to be loadable and to be capable of being tied into the control program while it is running, characterized in that

the software function blocks (SF01, ..., SF04) are designed to be object-oriented and loadable into the field unit over the Internet and an Internet communication interface, and

the field unit has a software function block execution system (PLC object engine system; Bos, ExE, Wd, IO) for tie-in of the software function block (SF01, ..., SF04) and for processing the control program.

25. (NEW) Intelligent field unit according to claim 24, characterized in that

the software function block execution system has an exe engine object (ExE), a watchdog (Wd), a bootstrap (Bos) and an input/output module object (IO), in which a process image of inputs and outputs can be deposited and to which signal states can be sent from process inputs and through which signal states can be sent to process outputs,

before the start of control operation, the bootstrap (Bos) generates the software function block objects (SF01, ..., SF04) and the input/output module object (IO) and sends the following to the exe engine object (ExE):

for the case of cyclic processing of the control program, a list of the software function block objects (SF01, ..., SF04) to be processed,

for the case of interrupt-controlled processing of the control program, a list of the software function block objects (SF01, ..., SF04) to be processed for each process input,

at the start of control operation, the bootstrap (Bos) starts the exe engine object (ExE) which first starts the watchdog (Wd), which resets the exe engine object (ExE) when the cycle time is exceeded, and then cyclically

updates the inputs of the process image,

processes a processing step of the software function block objects (SF01, ..., SF04) for the case of cyclic processing of the control program,

ascertains changes in signal states at the inputs for the case of interrupt-controlled processing of the control program, and processes the software function block objects (SF01, ..., SF04) assigned to these inputs,

updates the outputs of the process image.

26. (NEW) Intelligent field unit according to claim 25, characterized in that the exe engine object (ExE) and the watchdog (Wd) are designed as threads.

27. (NEW) Intelligent field unit according to claim 24, characterized in that the communication interface permits TCP/IP protocol communication.

28. (NEW) Intelligent field unit according to claim 24, characterized in that the software function block objects (SF01, ..., SF04) are Java byte coded and can be created in Java C program language or in a program language in compliance with the IEC 1131 standard.

29. (NEW) Automation system

having at least one programmable controller to which software function blocks of a control program can be sent, the program being processed by the programmable controller cyclically and/or with interrupt control during control operation, the software function blocks being designed to be loadable and capable of being tied into the control program while it is running, characterized in that

the software function blocks (SF01, ..., SF04) are designed to be object-oriented and loadable into the programmable controller over the Internet and an Internet communication interface of the programmable controller, and

the programmable controller has a software function block execution system (PLC object engine system; Bos, ExE, Wd, IO) for tie-in of the software function block objects (SF01, ..., SF04) and for processing the control program;

having at least one programming unit for creating software function blocks of a control program that can be sent to a programmable controller which processes the control program cyclically and/or with interrupt control during control operation, the software function block objects being designed to be loadable and to be capable of being tied into the control program while it is running, characterized in that

the programming unit creates object-oriented software function blocks (SF01, ..., SF04),

the programming unit sends the software function blocks (SF01, ..., SF04) to the programmable controller over the Internet and an Internet communication interface of the programming unit, and/or

the software function blocks (SF01, ..., SF04) can be sent to the programming

unit over the Internet and the Internet communication interface; and

having at least one operating and monitoring device having operating and monitoring software blocks of an operating and monitoring software program for creating and displaying a process image that includes multiple image objects and is provided for process management, the image objects being related to software function blocks of a control program which is processed by a programmable controller during control operation, the operating and monitoring software blocks being designed to be loadable and to be capable of being tied into the operating and monitoring program while it is running, characterized in that

the operating and monitoring device creates object-oriented operating and monitoring software blocks,

the operating and monitoring software blocks can be transmitted by the operating and monitoring device over the Internet and the Internet communication interface of the operating and monitoring device, and/or

operating and monitoring software blocks and/or process quantities can be sent to the operating and monitoring device over the Internet and the Internet communication interface, and

the operating and monitoring device has an operating and monitoring software block execution system (operating and monitoring object engine system) for processing the operating and monitoring software blocks.

30. (NEW) Automation system according to claim 29 with at least one intelligent field unit to which at least one software function block of a control program can be sent, the program being processed by the field unit cyclically and/or with interrupt control during control operation, the software function block being designed to be loadable and to be capable of being tied into the control program while it is running, characterized in that

the software function blocks (SF01, ..., SF04) are designed to be object-oriented and loadable into the field unit over the Internet and an Internet communication interface, and

the field unit has a software function block execution system (PLC object engine system; Bos, ExE, Wd, IO) for tie-in of the software function block (SF01, ..., SF04) and for processing the control program.

31. (NEW) Automation network

having an automation system having at least one programmable controller to which software function blocks of a control program can be sent, the program being processed by the

programmable controller cyclically and/or with interrupt control during control operation, the software function blocks being designed to be loadable and capable of being tied into the control program while it is running, characterized in that

the software function blocks (SF01, ..., SF04) are designed to be object-oriented and loadable into the programmable controller over the Internet and an Internet communication interface of the programmable controller, and

the programmable controller has a software function block execution system (PLC object engine system; Bos, ExE, Wd, IO) for tie-in of the software function block objects (SF01, ..., SF04) and for processing the control program;

having at least one programming unit for creating software function blocks of a control program that can be sent to a programmable controller which processes the control program cyclically and/or with interrupt control during control operation, the software function block objects being designed to be loadable and to be capable of being tied into the control program while it is running, characterized in that

the programming unit creates object-oriented software function blocks (SF01, ..., SF04),

the programming unit sends the software function blocks (SF01, ..., SF04) to the programmable controller over the Internet and an Internet communication interface of the programming unit, and/or

the software function blocks (SF01, ..., SF04) can be sent to the programming unit over the Internet and the Internet communication interface;

having at least one operating and monitoring device having operating and monitoring software blocks of an operating and monitoring software program for creating and displaying a process image that includes multiple image objects and is provided for process management, the image objects being related to software function blocks of a control program which is processed by a programmable controller during control operation, the operating and monitoring software blocks being designed to be loadable and to be capable of being tied into the operating and monitoring program while it is running, characterized in that

the operating and monitoring device creates object-oriented operating and monitoring software blocks,

the operating and monitoring software blocks can be transmitted by the operating and monitoring device over the Internet and the Internet communication interface of the operating and monitoring device, and/or

operating and monitoring software blocks and/or process quantities can be sent

to the operating and monitoring device over the Internet and the Internet communication interface, and

the operating and monitoring device has an operating and monitoring software block execution system (operating and monitoring object engine system) for processing the operating and monitoring software blocks; and

having at least one workstation and/or a server which have means for creating and processing object-oriented software function blocks (SF01, ..., SF04).